Transportation Synthesis Report

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Implementing Design-Build

Prepared for
Bureau of Highway Construction
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Transportation Synthesis Reports (TSRs) are brief summaries of currently available information on topics of interest to WisDOT technical staff in highway development, construction and operations. Online and print sources include NCHRP and other TRB programs, AASHTO, the research and practices of other state DOTs, and related academic and industry research.

REQUEST FOR REPORT

In the fall of 2000, WisDOT convened a work group to consider issues related to use of design-build construction contracts for state transportation projects. The work group was composed of individuals from WisDOT, FHWA, academia, and the consulting and contracting industries. The purpose of the discussion was to consider broad issues such as the reasons for the department's interest in design-build, its potential risks and benefits, and some of the details related to implementing design-build in Wisconsin. Information for the work group discussion was gathered from telephone interviews with other state DOTs, a literature search, a review of FHWA's Proposed Rule on Design-Build, and an extensive review of design-build procedures employed by Florida and Washington DOTs. WisDOT issued a report in February 2002 summarizing the work group's discussions and clarifying the department's then-current position on a number of specific issues. No further action on design-build was planned at that time.

Now, more than a year and a half later, WisDOT is renewing its review of the potential for design-build to shorten project completion time, minimize impacts on the public and adjacent businesses, and encourage innovation in project design and delivery. Ongoing staff reductions are also providing a powerful motivation to explore alternative ways of doing business. The RD&T Program was asked to review current design-build practices nationwide, highlighting both pros and cons. This report is a first step in assisting the BHC director in crafting a roadmap for implementing design-build in Wisconsin. The information here will be used to plan follow-up interviews with other state officials to gain a more detailed understanding of what works and what doesn't, and the processes used to move successfully from an exclusive design-bid-build environment to one that has a significant design-build component.

SUMMARY

Design build, according to some reports, will eclipse low-bid construction in all categories (not just transportation) in the U.S. by 2005. From 1985 to 1999, the practice grew from five percent of all construction to one-third.

Until recently, FHWA regulations did not allow state transportation agencies to contract design-build contracts with federal aid, except through the Special Experimental Project Number 14, "Innovative Contracting." SEP-14 allowed its 25 participants to conduct a limited number of design-build projects to study the efficacy of the method. However, these individual experiences were not formally gathered until New York commissioned a study that became the basis for an American Association of State Highway Transportation Officials report we discuss below.

According to AASHTO, over half the country's state transportation agencies employ design-build to some extent under SEP-14. Project sizes range from $200,000 to $1.56 billion for I-15 in Utah or $1.67 billion for the in-process project T-REX in Colorado. In December 2002, FHWA issued its long-awaited design-build rule – http://www.dot.state.mn.us/designbuild/fhwafinrul.pdf – that provides the standards and specifications states must meet in order to enjoy federal aid on design-build contracts. The floodgates have opened for design-build, now no longer an experimental procedure, to wash across the country.

The new FHWA rule, effective January 2003, essentially renders the SEP-14 provision permanent, removing the experimental qualifier and the need for extensive review of project documents. A few changes include relaxing restraints on state use of value-engineering principles to assess contract bids; removing the requirement that design-build projects be defensible as cost-effective; a loosening of right-of-way acquisition requirements prior to bid letting; relaxation of warranty requirements to the level of general project warranties; and a general reduction in the complexity of SEP-14 regulations.

The agencies that have used design-build thus far have realized a variety of benefits. Foremost is cost-certainty, as change orders and other contingencies do not (or need not, depending on specifications) impact the final project price. In most cases, construction time has been shortened, often by as dramatic a period as 2 ½ years. (One job is expected to finish three years faster than by traditional contract methods.) Other benefits reported with varying frequency include: savings in contract cost; improvements in industry-agency relations; innovations in staging, design, construction; reduced agency staff workloads; fewer legal claims; and public approval.

Drawbacks have also emerged, though there remains a remarkable sense of confidence that these can be managed. Most states report reluctance from contracting and consulting firms, which fear the consolidation of projects into big contracts that favor out-of-state contractors, or only the largest of in-state firms. Problems with developing procedures emerge, in some cases cost savings are not realized, and innovation has not blossomed from design-build in the way theorized.

In this report we rely heavily on AASHTO for a broad-brush look at the state of the practice, perspectives augmented by a survey conducted for Illinois DOT, and a few of the several state-developed state-of-the-practice reports. We then focus on five states at the forefront of design-build practices (FL, UT, AZ, OH, NC), selected either for their reputation or representative experience. We review the way in which these agencies use design-build, the benefits they experience, and the drawbacks (sometimes merely potential) they grapple with. Links are also provided to three other states (MN, CO, WA) with useful resources on the Web. We end this report with a list of some of the most important issues and procedural areas WisDOT may wish to consider as it lays plans for implementing this relatively new but clearly successful transportation construction method.

NATIONAL DESIGN-BUILD TRENDS

Still in infancy for transportation, design-build enjoys no uniform program structure from state to state. Yet trends in its use, benefits and drawbacks have certainly emerged. An excellent report from the AASHTO Joint Task Force on Design-Build – "Current Design-Build Practices for Transportation Projects," http://www.transportation.org/committee/design/db_report.html – offers a rich review of practices and issues concerning transportation agency use of design-build contracting. By combining this report with a national survey conducted for Illinois DOT – "2002 Survey by SAIC for Illinois DOT on the Current Use of Design-Build," http://www.fhwa.dot.gov/programadmin/contracts/survey02.htm – we were able to gather significant data for a look at national practice. Because of overlap between the reports, we have combined their results here.

As of late 2002, Washington, D.C. and the following 27 states had approved design-build contracts for construction or repair of highways and/or bridges: Alaska, Arizona, Colorado, California, Delaware, Florida, Georgia, Hawaii, Indiana, Louisiana, Massachusetts, Maryland, Maine, Michigan, Minnesota, New Jersey, New Mexico, New York, North Carolina, Ohio, Oregon, Pennsylvania, South Carolina, Texas, Utah, Virginia, and Washington.

The AASHTO report, drawn from a 2002 study conducted for New York, offers detailed descriptions of a handful of projects by state and municipal transportation agencies, collating information according to a wide array of categories, including procurement, contract issues, project management, payment, schedule, warranties, insurance and bonds, and more. While each of the agencies is not always represented in each section, the overview is fairly complete.

The Illinois survey, also conducted in 2002, follows a question-and-answer format on expectations, benefits, contract procurement, management, and more. Answers of these 11 specific respondents frequently overlap with those of the seven state transportation agencies in the AASHTO report; furthermore, some responses suggest the survey was issued several years before 2002. Nevertheless, answers are candid and informative.

Use. Projects range from small county highway improvements to large scale, transit-and-urban-freeway projects. Values can be as slight as a $197,000 bridge rebuilding in Ohio to as hefty as $1.56 billion for an urban highway project in Salt Lake City. Typically, projects involve urban transportation, often freeways. Many states tried pilot projects under SEP-14, and then planned for larger-scale implementation. Washington State, for instance, used a $22 million grading project as a pilot. Impressed, the state has developed a program that will use design-build on Seattle-area projects that range from $200 million to $2 billion. States keep the value of all design-build projects at levels ranging from a few small projects per year, to five percent of all projects in Maryland, to up to ten percent in Minnesota. We found no state with specific policy directives to use design-build on a proportional scale greater than ten percent, though it seems likely that without such directives, some state transportation agencies do exceed that level of commitment.

Benefits. The one universal benefit of design-build has been cost certainty. Even with contingency funds, which yield bonuses to contractors if unused at certain levels, project cost certainty has been a constant. Faster delivery time also has resulted for the majority of agencies discussed in these two reports; benefits range from as little as a few weeks to as much as 2½ in Utah to three years in Arizona. Also quite common is a reduction or elimination of claims against projects. Furthermore, very few agencies experience sustained resistance from contractors or consultants; in most cases, when such concerns have arisen agencies have engaged the concerned in developing procedures or in public forums in order to identify and address the anticipated problems. In each of these cases, states profess that none of the anticipated problems have materialized in practice.

Other benefits have been more elusive. A slim majority has experienced cost savings, or anticipates savings as design-build programs develop; these can be slight, or can be as dramatic as $30 million for projects in Atlantic City and Utah. A few respondents noted that cost growth has been eliminated, even if project costs may be higher initially than conventional design-bid-build projects. Many respondents report reduction in demands on state staff, though in most cases agencies note spurts in staff demands; early in the RFP and design stages, demands intensify beyond conventional experience, and then drop off dramatically. Quality improvements, innovations in financing, design, or construction techniques, and contractual shifting of maintenance duties to contractors have been identified by a few of the respondents.

Drawbacks. Construction industry resistance frequently emerges as an early concern for states. Only Arizona has suffered extended resistance; the industry lobbied the legislature tenaciously enough to win limitation of design-build contracts to only two per year for projects estimated to cost at least $40 million. Innovation has been rare, as well; only Ohio reports taking innovative techniques in construction from the practice, though it plans to apply the information to traditional contracts. A third of respondents reported no benefit in saved time, and New Jersey reported a project that took longer as a design-build than it would have as a conventional project. Several states have linked design-build problems to low-bid acceptance criteria, recommending instead the use of best-value appraisals. Generally, agencies view drawbacks as indicators that procedures or contractual components require adjustment, though in no case overhaul.

AASHTO Design-Build Committee Web site: http://www.transportation.org/committee/design/tf_designbuild.html. See, especially, the References and Links sections for contact information, state Web sites, etc. See also the FHWA site devoted to design-build, http://www.fhwa.dot.gov/programadmin/contracts/d_build.htm; this site includes reports, several states' design-build guidelines or regulations, design-build laws in a few states, and more.

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FLORIDA

Florida has been letting design-build contracts since legislative authority to do so was conferred in 1987. In 1995, Florida passed legislation for design-build projects on rail corridors, buildings, and major bridges; in 1996, this authority was expanded to all project types, including highways. In addition to carrying the most experience of state transportation areas in this practice, Florida also maintains a detailed Web site devoted to its design-build program.

Use. The proportion of design-build projects to overall transportation work is not available.

- Commitment Level. Since legislation was passed in 1987 allowing for design-build pilots, up to 50 transportation projects were completed through January 2002. By summer of 2002, many more were added to a project cost cumulative total of $1.3 billion. According to the Indiana/Purdue report ("An Initial Evaluation of Design-Build Highway Projects Performed by Indiana Department of Transportation," http://rebar.ecn.purdue.edu/JTRP_Completed_Project_Documents/SPR_2497/FinalReport/spr_2497_final/Report.pdf). Florida DOT caps design-build contracts at $120 million per year.
- Project Selection. Florida DOT selects projects for design-build if they entail some or all of the following characteristics: need and possibility for quick or early completion; minimal right-of-way acquisition and utility relocation; well defined in scope; room for innovation in design and/or construction; low risk of unforeseen conditions; low possibility for significant change during work. Bridges, interstate and rural widening, fencing, landscaping, lighting and signing may suit design-build.

Benefits. Early in the pilot process, significant cost savings did not develop, but the agency expressed belief that prices for design-build projects would drop over time as familiarity grew in the agency and the consulting and contracting industries. This belief bore out. The original 11 projects, worth about $30.5 million, showed a 36 percent decrease in design and construction time, but a five percent increase in cost. Now, however, Florida claims that unit costs for projects have dropped to six percent below design-bid-build costs. Projects have been completed on average 33 percent faster than with traditional contracts. The state claims closer relationships with contractors than before design-build was used. The state believes design-build projects have been of higher quality than other projects, and asserts that less than half the legal claims and litigation associated with design-bid-build have obtained with design-build. Furthermore, design-build projects have experienced no contract growth, and have produced innovation in staging strategies.

Drawbacks. Growing pains were felt early in costs, which were higher than with traditional projects. Florida claims that initial contract costs were up ten percent over traditional projects, but by the end of construction, overall costs were less than with traditional. Florida did not find any innovation in design or construction emerging from design-build projects. Furthermore, relationships with contractors and consultants were poor in anticipation of the first pilot project in 1991. Contractors resisted change, and consultants balked at developing the required relationships with contractors for design-build. Florida was successful, however, in addressing these concerns by including contractors and consultants in development of more pilot projects.

Design-Build Web Site: http://www11.myflorida.com/construction/Design%20Build/Design-Build.htm. Extremely thorough, this site contains specifications, project summaries, contract documents, including detailed charts on project costs, all procedures and contract details, and more. .

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UTAH

Utah was the first state to employ design-build on a very large project. Reconstruction of a major Salt Lake City arterial, Interstate 15, had to be finished for the 2002 Winter Olympics. The $1.56 billion project entailed replacement of a six-lane highway with an eight-lane, addition of HOV and auxiliary lanes in each direction, reconstruction of 142 bridges, and installation of an automated traffic-management system. Extremely successful, this project is something of a poster-child for transportation design-build. The process has become routine enough in Utah that, at this point, it assigns RFP and project management duties for design-build to project engineers.

Use. Utah uses design-build for projects ranging from $1 million to rapidly clear a landslide over a rural highway, to the I-15 reconstruction. The latter proved the first combination of design-build delivery with highway performance specifications, shared risk provisions, best-value selection, award fee incentives, stipends to proposing firms, and design oversight. Current RFPs on the state's design-build Web site include traffic lights at three

intersections with no engineer's estimate and a $600,000 bicycle-pedestrian tunnel; only four RFPs are posted at this time. Procedurally, once a project is estimated at $50 million or more, a different set of rules governs these design-builds than smaller ones.

Benefits. Utah experienced minimal disruption of traffic and timely delivery of the I-15 project in 4 ½ years (under conventional processes, this would have taken seven years); costs were minimized (Utah saved about $30 million using design-build on I-15), the quality of the highway was improved, and road use suspensions were less serious than under conventional contracts. None of the handful of projects since has experienced cost increases, and the public has approved of the process.

Drawbacks. The I-15 project was so schedule-driven that value engineering was perceived as impediment; design standards and plans were developed after designing begun, causing delays; mixed performance and prescriptive specifications limited innovation; constructability reviews proved ineffectual; accelerated construction forced hasty designs in situations like retaining wall specifications, creating conflict between builders and designers. Drawbacks on smaller projects were unavailable. Contractors and consultants were apprehensive early in the design-build process, but meetings with state officials and employees, the public, legislators, and contractors and consultants proved effective in sharing advance information and alleviating fears.

Design-Build RFP Site: http://www.udot.utah.gov/index.php/m=c/tid=438. On I-15, two reports – on design, http://www.dot.state.ut.us/dl.php/200309261811492/UT-99.13.pdf, and on user costs, http://www.dot.state.ut.us/download.php/200310312306122/UT-03.23.pdf – are useful. For procedures, see Utah Administrative Code Rule for Design-Build, http://www.rules.utah.gov/publicat/code/r916/r916-003.htm.

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ARIZONA

Often cited for its dramatic successes with design-build, ADOT reserves design-build only for projects estimated at $40 million or more. Three projects have been completed; project estimates of the three together totaled about $400 million, and contracts were completed for about $315 million. One of these, a 14-mile road reconstruction on State Route 68, won a 2003 Design-Build Award from the Design-Build Institute of America – see www.dbia.org.

Use. Arizona DOT has used design-build mostly on large projects entailing freeway widening, reconstruction of interchanges, conversion of 2-lane roads to 4-lane divided. Project estimates start at about $45 million. Due to lobbying successes by contractor organizations, projects are only eligible for design-build at estimates of $40 million or greater. The three completed projects to date came in with bids about $85 million less than department estimates.

Benefits. Speed, cost and other benefits, such as customer satisfaction, reduction in administrative workloads for ADOT staff, and more have been realized.

- Speed. The I-17 reconstruction – seven miles widened, 14 miles of frontage overlaid, 24 ramps and two interchanges rebuilt – was finished in 21 months. Under normal design-bid-build procedures, ADOT estimates it would have taken five years. The State Route 68 project came in 1 ½ years faster than by conventional methods, and US 60 – a high cost project with 13 miles of road and six bridges widened – was bid at 25 months, compared to the department estimate of 36 months, and a conventional process schedule of five years.
- Cost. Each of these saved money. The I-17 reconstruction, finished in 2000, saved $1.6 million in motorist delay and about $5 million, or six percent, in project cost. Route 68 saved ADOT about $2 to $3 million. Most dramatic has been the US 60 project. Estimates for the design-build project were $255 million, yet the winning bid came in at a touch over $184 million. Project cost savings come in at six percent less than conventional design-bid-build.
- Other. Road user priorities in Arizona start with speed of construction; dramatic timesavings on these projects met that need, and resulted in citizen support for design-build. Compared to conventional projects, ADOT uses smaller engineering crews, monthly contractor payment schedules lower administrative costs, and construction-engineering costs are 1-2 percent below normal. Change orders have dropped. The I-17 project would conventionally trigger over 60 change orders, but as design-build it generated only 16, saving over $65,000 in administrative costs on changes. Though it came in five percent over the bid amount, the project still saved several million dollars.

Drawbacks. Contractor resistance was mobilized more effectively in Arizona than in any other state that has developed a design-build program. Contractors and consultants pressed for and won legislation that limits design-build projects by ADOT to two per year, at project costs of at least $40 million each.

Design-Build Web Site: http://www.dot.state.az.us/Roads/Constgrp/InDBpage.htm. Contains guide, status reports, procurement procedures; see the very helpful 2001 status report, a January 2002 memo, at http://www.dot.state.az.us/Roads/Constgrp/InDBmemo.htm.

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OHIO

Though still in a transitional phase toward permanent use, Ohio has used design-build the most extensively of the upper Midwest states at this time, and has since it conducted six pilot projects in 1995. Temporary legislation allows for a design-build biannual budget of $250 million, renewable; passed in 1999, the legislation yielded a big jump in such projects in 2000. Permanent legislation supporting design-build is being sought.

Use. Bridge replacements, resurfacing, widening of lanes, replacing bridge decks, painting bridges, applying concrete pavement overlays, adding lanes, lighting, sign replacement, noise barrier constructions – all are done via design-build. Projects range from $197,000 bridge replacements to $50 million highway lane additions.

Benefits. Ohio has enjoyed substantial savings in time and cost. Fast-tracking has reduced the time between start of design and start of construction by 50 percent, leading to shorter project completion times. Costs have gone down accordingly, change order delays have been reduced, and ODOT has picked up innovative construction techniques it applies now to traditional, design-bid-build projects.

Drawbacks. Officials have reported no problems with design-build. However, issues of contract risk were clearly of concern to ODOT, as it insists on the use of prescriptive specifications rather than performance specifications, a policy they claim is an effective tool for limiting contractor risk.

Design-Build Web site: http://www.dot.state.oh.us/construction/OCA/DesignBuild/default.htm. Includes general introduction, guidelines for implementation, specifications and provisions.

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NORTH CAROLINA

In 2002, legislation in North Carolina boosted the number of design-build projects it was authorized to contract, from three per year to ten in 2003 and 25 for each of the next six years.

Use. By April of 2003, NCDOT had contracts ranging from $6 million to $180 million. Projects include new construction, widening of urban highways and of interstates, railroad bridge replacements, and more. Projects eligible for design build must fit one of the following four descriptions: its completion is an emergency; it entails complex constructability issues; it poorly suits design-bid-build procedures; it requires acceleration for public benefit.

Benefits. The NCDOT chief engineer said in a speech last January that the speed and innovations design-build encourages can shorten the entire course of some projects by three years. On average, larger projects that take nine years save two years through design-build. Costs have come down, according to several reports, but specific figures prove elusive. Smaller projects see little timesavings through design build, though some cost savings. In one project, a contractor eliminated a planned bridge, significantly cutting project costs.

Drawbacks. Little innovation has emerged from design-build, though NCDOT expects some will. Staffing has been unaffected by design-build, though it does not threaten erosion of skills. Cost savings have been difficult to determine, and are thought to be negligible; though bids come in under estimates, estimates have become more difficult because so much planning an design cannot be considered in developing the RFP. Furthermore, contractors

and consultants resisted the new process in fears that small firms will be cut out of the process. NCDOT helped assuage these concerns thus far by including these professionals in the procedure-development process.

Design-Build Web site: http://www.doh.dot.state.nc.us/preconstruct/highway/dsn_srvc/contracts/design_build/. Provides policy and procedures, and extensive documentation of several current projects.

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OTHER STATES

The following states have few projects completed, but offer useful resources on the Web. Minnesota and Washington have completed some pilots, as has Colorado, and have plans for wider application of design-build. Colorado is currently using design-build on its well-publicized highway and light-rail project, T-REX.

Minnesota. Though authorized to contract as much as ten percent of its projects as design-build, MNDOT currently only conducts three to five per year. The state is developing a design-build program that fully lays out the procedures and regulations for design-build that it uses in developing short lists of qualified bidders, in awarding contracts, in overseeing design-build projects. The ten percent provision is the highest of any state transportation agency we have found that hews to a policy specifying that a specific proportion of its contracts be design-build. Though in a systematic shift from SEP-14 policies to permanent provisions, MnDOT still is wrapping up some SEP-14 projects, and the site includes interesting papers like one on procurement lessons learned, http://www.dot.state.mn.us/designbuild/hiway52/ROC52%20Lessons%20Learned%20Final.pdf.

Design-Build Web site: http://www.dot.state.mn.us/designbuild/. Contains overviews, specifications, reviews of national practice, more. Of particular interest are eight recent (August 2003) white papers outlining MnDOT's basic approach to design-build.

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Colorado. After piloting a couple $50 million interstate rehabilitations using design-build low-bid procurement, legislative authority in 1999 called for best-value design-build. T-REX, a giant Denver freeway and light rail rehabilitation and construction project, was the first such project. According to the T-REX Web site, it is a $1.67 billion project, and will be done in 2006, 22 months ahead of schedule.

T-REX Web Site: http://www.trexproject.com/. Contains project overview, progress reports, traffic updates.

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Washington. A $22 million grade separation project was used as a pilot, and was found to minimize time. Initial costs, however, were up, although cost growth through 2002 on new projects has been lower than with design-bid-build.

Design-Build Web Site: http://www.wsdot.wa.gov/biz/InnvContract/desbuild.htm. Contains overviews, project descriptions, pilot summary, legislation, more.

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ISSUES TO CONSIDER

The experiences of agencies using design-build suggest a variety of considerations to be weighed by WisDOT as it explores development of a design-build program. We have selected the common concerns, policies and considerations of other agencies, and offered them as categories below. Each such category deals with a facet of design-build contracting that will need to be well framed in developing a design-build program. Most of these categories carry implications for the response of the contracting and consulting community to the new program, for project cost, or for innovation that might emerge.

These are not easily separated issues, in some cases. We offer here merely a starting point of issues to consider in building a design-build program.

Incentives and Disincentives. Agencies vary in their use of incentive and disincentive provisions, typically following practices used in design-bid-build procedures. An intriguing practice is to include in the contract a contingency fund for unexpected problems, construction difficulties, utilities provisions, and more. Typically, the contractor will be promised a certain amount of this fund as pay at the end of the contract, that amount varying with the amount of the fund the contractor used during design and construction. Links of bonuses to traffic access levels are used by some agencies; Arizona linked incentive payments to provision of public travel through the construction project in excess of the minimum volume required in the contract. Other states have accorded bonuses for early completion and for progress ahead of schedule.

Low Bid versus Best Value. Many states use low-bid criteria for selecting contractors for design-build. Few, however, seem satisfied. It seems low-bid constricts the development of innovation and quality in projects. Best value seems to be the standard states intend to use.

Miscellaneous Contract Provisions. States vary in approaches to many contract components not yet mentioned. Bonds, for instance; for smaller projects, 100 percent payment and performance bonds are common; for larger projects, which face difficulty securing 100 percent surety for mega-projects, and furthermore entail in the bidding process few contractors with sufficient bonding capacity to meet 100 percent, agencies often require less than full bonding, relieving pressure on contractors and leaving more options available to small firms. Risk allocation, project management, warranties and maintenance provisions also vary from state to state.

Performance versus Prescriptive Specifications. This issue is another that can impact innovation levels and costs to contractors. States that have used prescriptive specifications have contained the options in materials and design open to the winning contractor. Those that have used performance specifications have, on the other hand, afforded the contractor freedom in materials and design and in construction technique, to the benefit of cost to contractor, speed of work, and innovations to emerge. However, prescriptive specifications allow a measure of control in a contracting paradigm that diffuses owner control dramatically, compared to traditional design-bid-build projects, offering a certain cultural comfort to the contracting agency. This decision can also carry implications for the quality-control/quality-assurance facets of a contract, which also vary dramatically from state to state and job to job.

Planning and Design Input. The level of planning and design conducted by the state transportation agency before award of the contract varies from agency to agency. Generally, the more design before issuing of RFP, the less innovation can be expected of the contractor. Reasons for significant levels of design – say, 30 percent – being conducted by the state is to fast-track the process, allowing construction to start even sooner than otherwise expected of design-build. States like Indiana, for instance, or Utah on its I-15 project, find that sometimes construction begins too soon. (Indiana, by the way, is considering a novel evasion of this problem; by awarding design-bid projects in late fall, the winter dead-time for construction allows adequate design progress before ground can be broken on the project.) Deciding the level of design to be provided in the RFP, then, can have implications for the innovations the project can produce. North Carolina, for instance, does most of the design, along with all the environmental assessments and permits, and has noted little innovation on its projects, though not a complete dearth – we mentioned above that one contractor eliminated a bridge in the NCDOT design altogether.

Pre-Let Permitting. Environmental permits and right-of-way typically are kept as the responsibility of the contracting agency, though certainly not in all cases. Timing of the securing of these permits – whether before letting the contract or after – can impact project completion time, particularly on small and fast projects.

Furthermore, risks can be associated with issues of right-of-way, and states vary in the contractual obligations of owner and contractor with respect to risks.

Procurement Process. Standards for acceptance, the use of stipends to compensate proposing firms for the considerable expense of their design work during bidding, and other such issues must also be considered. Many states use short-listing, and it appears all use some sort of pre-qualification process.

Quality Assurance/Quality Control. Most agencies put the responsibility for quality control in the hands of the design-builder, but the matter of quality assurance enjoys less consensus. Many states choose to retain QA oversight, but confer QA responsibility on the contractor. This maintains the single-source motivation behind design-build, shifts the burden of risk away from the agency, and suits the widespread pressure on states to cut staff or maintain lower staff levels.

Small Firm Participation. Most states insist that a certain level of design or construction – say, 30 percent – be assigned to the project's subcontractors. States often restrict contractors to an upper limit – e.g., 70 percent in Colorado – that the prime contractor can do. Others require a minimum; Virginia, for example, insists the prime contractor do 30 percent of the work or more. Furthermore, with these stipulations an agency often attaches a DBE participation requirement – in Virginia, again, at least ten percent of the work must go to DBE.

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Implementing Design-Build
The MnDOT Experience

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REQUEST FOR REPORT

This report follows up on the more general information contained in the November 24 review of design-build trends and practices around the country. This report focuses on the experience of the neighboring state of Minnesota, based on a review of information on the MnDOT Design Build Web site at http://www.dot.state.mn.us/designbuild/ and a conversation with Paul Huston, MnDOT Design-Build Program Coordinator, paul.huston@dot.state.mn.us, 651-284-3605. He and his team would be happy to meet with WisDOT staff to review the process MnDOT began three years ago and the current status of MnDOT's objective of establishing an institutional, programmatic approach to design-build.

MNDOT DESIGN-BUILD CHRONOLOGY

- **November 1999**. MnDOT assigned Paul Huston full time to explore design-build.

- **November 2000**. Two-day Design-Build North Star Workshop with 200 MnDOT staff, contractors and consultants. Presentations from Colorado, Arizona, FHWA, others. Small group reactions, summary report. Details at: http://www.dot.state.mn.us/designbuild/ws/index.html.

- FHWA SEP-14 Design-Build Projects. Described in detail at http://www.dot.state.mn.us/designbuild/. MnDOT contracted with a consultant to prepare documents and help guide the process for these first three projects.
  - **April 2001**. Highway 14 RFP. Low bid Design-Build.
  - **September 2001**. Highway 100. Low bid Design-Build. Est. cost $19 million.
  - **June 2002**. Highway 52. Best Value Design-Build. Est. cost $239 million.

- **June 2001**. Passage of Minnesota Design-Build legislation authorizing the maximum annual number of design-build projects as 10 percent of the total number of projects awarded in the previous year (about 300 annually). See the text of the law at http://www.dot.state.mn.us/designbuild/db_law.doc and an analysis at http://www.house.leg.state.mn.us/hrd/pubs/stcntrct.pdf , pages 4-5.

- **December 2002**. FHWA issues Final Rule for Design-Build Contracting: http://www.dot.state.mn.us/designbuild/fhwafinrul.pdf.

- **February 2003**. MnDOT commits to developing a design-build program, appoints a Policy Group of top managers and hires HNTB as lead consultant, along with a team of additional consultants, to begin developing design-build policies (White Papers): http://www.dot.state.mn.us/designbuild/.

- **May 2003**. One-day MnDOT Design-Build Industry Workshop to discuss key issues. Draft summary report at http://www.dot.state.mn.us/designbuild/ws/ws0521.doc.

- **October 2003**. MnDOT launches the Innovative Construction Initiative under the leadership of Governor Pawlenty and Lt. Governor Molnau. An ICI team is established in MnDOT to explore new ways of project design and construction, with design-build a major component. Partners in the Initiative include city and county engineers, contractors, consultants, utility companies, and the General Engineers Council. Details at http://www.dot.state.mn.us/information/ici/index.html.

MINNESOTA DESIGN-BUILD LEGISLATION

See text at http://www.dot.state.mn.us/designbuild/db_law.doc. Summary below from Minnesota House of Representatives Research Department: http://www.house.leg.state.mn.us/hrd/pubs/stcntrct.pdf.

- The number of design-build contracts in any fiscal year may not exceed 10 percent of the total number of transportation construction contracts awarded in the previous year.
- Final determination to use design-build may be made only by the Commissioner of Transportation.
- Two-phase design-build process:
  - Request for qualifications (RFQ) to establish a short list of no more than five of the most highly qualified firms.
  - Request for proposals (RFP) to the design-builders on the short list.
- A technical review committee scores the proposals, using criteria specified in the RFP.
- After the sealed bids with price information are opened, for each design-builder the price is divided by the technical proposal score to obtain an adjusted score. The commissioner must select the design-builder who is responsive and responsible and whose adjusted score is the lowest. The statute specifies a method of adjusting bids for a time factor if a time factor is included in the RFP.
- The law requires the commissioner to award a fee of not less than 0.2 percent of the contract cost to each short-listed responsible proposer who provides a responsive but unsuccessful proposal.
- The law specifies an alternative method of relating price to qualifications for large projects (over $5 million).
- The law also specifies an alternative low-bid design-build process where the scope of work can be clearly defined. Under this process an RFQ is optional. Also under this process, there is no ranking or scoring of technical proposals, but rather only a determination if a proposal complies with the RFP and is responsive. After review of the technical proposals, the contract must be awarded to the lowest bidder whose proposal is responsive to the RFP.
- The commissioner is authorized to reject all bids in any design-build process.

MNDOT DESIGN-BUILD WHITE PAPERS – AUGUST 2003

The design-build consultant prepares drafts of white papers, which are aimed at documenting policy positions of the department regarding key design-build issues. Each white paper is reviewed and finalized by the MnDOT Policy Group and Design-Build Team. The following are posted on the MnDOT Design-Build Web site at http://www.dot.state.mn.us/designbuild/.

- Approach to Notice to Proceed – White Paper No. MN-31
- Third-Party Agreements – White Paper No. MN-26
- Approach to Alternative Technical Concepts – White Paper No. MN-11
- Approach for Basic Configuration – White Paper No. MN-4
- Approach for Category A/Category B – White Paper No. MN-6
- Approach to Change Orders – White Paper No. MN-20
- Approach to Differing Site Conditions – White Paper No. MN-16
- Approach to Dispute Resolution – White Paper No. MN-14